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MR. WILLIAMS: That's –

THE COURT: The 1994 decision by Judge Giles.

(Laughter.)

MR. MATTIONI: Then, your Honor, I repeat that the claim right now for injunctive relief is not under CERCLA and I don't think anybody can say otherwise. That's the fact.

MR. MARTIN: Your Honor, may I address this one scenario, the RCRA issue, by pointing to the Price case which is in the handout? I'll just read the language because I think it addresses exactly what you and Mr. Mattioni have been talking about.

The Court there says, talking about a subsequent purchaser: "As owners of the property, the AGA defendants are, we conclude, contributing to the disposal, i.e., leaking of waste merely by virtue of their studied indifference to the hazardous condition that now exists. The idea that ownership imposes responsibility for hazardous conditions on one's land is certainly not novel."

And they go on to say: "As sophisticated investors they had a duty to investigate the actual conditions that existed on the property or take it as it was. They deliberately chose the latter course. Moreover, they became aware in the summer of 1979 that toxic chemicals had been dumped at the landfill but they have done nothing to abate the hazardous condition that exists. Under these conditions

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the AGA defendants may be responsible to have stopped the continued leaking of contaminants from the site."

That's a RCRA 7003 case, your Honor.

THE COURT: Well, it's 12:30, thank you very much. 1:15.

(Court in recess; 12:31 to 1:22 o'clock p.m.)

THE COURT: Good afternoon. Please be seated.

MR. SITHER: Your Honor, the United States calls Dr. Richard DeGrandchamp.

DR. RICHARD L. DeGRANDCHAMP, Plaintiff's Witness, Sworn.

THE COURT CLERK: Please be seated. Please state your name and spell your last name for the record.

THE WITNESS: My name is Richard DeGrandchamp, spelled D-e-G-r-a-n-d-c-h-a-m-p.

DIRECT EXAMINATION

BY MR. SITHER:

Q: Good afternoon, Dr. DeGrandchamp. Dr. DeGrandchamp, are you currently employed?

A: Yes, I am.

Q: And where are you employed?

A: I am the president of Scientia Veritas, a small consulting firm specializing in toxicology risk assessment in occupational medicine.

Q: How long have you been employed with this company?

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A: Approximately five years.

Q: What is your educational background?

A: I have a Bachelor in – Bachelor of Science degree from Eastern University – Eastern Michigan University in biochemistry. I have a Doctorate that I earned from University of Michigan Ann Arbor.

(Pause.)

THE COURT: Sorry, proceed, please.

BY MR. SITHER:

Q: Would you continue with your educational background?

A: Yes, after receiving a Ph.D. in toxicology from U of M, I went on to become a postdoctoral fellow, a Rutgers Fellow at the University of Rutgers University. And I had a joint appointment at Cornell Medical School as an associate research, guiding some students through their Ph.D. or Doctoral thesis.

From there I went to University of Colorado Medical School in the Department of Physiology and spent three years there as a National Institute of Health Fellow.

Q: Okay. And what is toxicology?

A: It's basically the study of toxic substances on humans where we perhaps use risk assessments to quantify the risks or health effects, but it's basically the study of toxic effects in humans.

Q: How do you use toxicology to evaluate the health threats

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to people?

A: Well, we have a variety of tools that we use. The first, of course, the best one is a toxicological evaluation where we may take some blood samples, some hair samples to measure body burden. The other tool that we can use to quantify risks at a site, particularly at hazardous waste sites is risk assessment.

Q: Okay. Do you consider yourself an expert in risk assessment and toxicology?

A: Yes.

Q: How many risk assessments have you performed?

A: Approximately 300 or so, between 300 and 350 risk assessments.

Q: Have many of these risk assessments been – involved sites where there was PCB contamination?

A: Roughly a hundred or so.

Q: Do you have any additional experience with PCB contamination at sites?

A: Yes. I'm currently developing two guidance documents for the Navy's Bureau of Medicine, the first relating to determining background levels of PCBs. There are very complex mixtures so I developed a new statistical tool using linear regression for establishing and defining background levels of PCBs in the environment.

The second guidance document that I'm currently

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writing is a document that actually prepares the Navy or provides guidance for the Navy on PCB contaminated sites so that it can transfer those properties currently being used by the Navy over for civilian use so that we can ensure when the properties are transferred they're health protective, they're not going to pose risks. And that deals primarily with collecting the right kind of data and how you use that data in human health risk assessment.

Q: Okay. Have you ever testified as an expert at a trial before?

A: Not a trial like this, no.

MR. SITHER: Your Honor, at this time I'd tender Dr. Richard DeGrandchamp as an expert in human health toxicology.

MR. MATTIONI: I have no questions at this time, your Honor.

THE COURT: Would both of you please keep your voices up, speak a little louder?

BY MR. SITHER:

Q: Dr. DeGrandchamp, do you have an opinion with a reasonable degree of scientific certainty whether the hazardous substances present at the Metal Bank site pose any threat to the health of people who come into contact with them?

A: Yes, after reviewing many site reports and the data sets generated at the Metal Bank facility, I've concluded that

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there is a potential threat to human health associated with primarily two human populations at the Metal Bank facility. The first being those people that catch fish nearby and consume them, perhaps their families eat the fish, the second being the occupational exposure. And that's a potential future exposure, of course, where that would involve the property being further developed perhaps with excavation to put in new buildings or develop the property.

Q: Do you have any –

MR. MATTIONI: If your Honor pleases, I hate to be obstructionist at the very beginning, but I don't believe that Dr. DeGrandchamp's two reports ever purported to represent him as offering an opinion of risk assessment type as opposed to talking about the risk assessment. And I would therefore move to strike the testimony because he gave us two separate reports, both of them after the close of expert discovery, and this is the first time we hear that he's giving this kind of opinion.

THE COURT: It's so close to common sense there is no– no harm if there is some kind of technical discovery violation. If there were, I'll excuse it.

With respect to risk assessment, you'll have an opportunity to ask him questions about his credentials. And with respect to whether certain chemicals can cause harm in humans, I will hear that testimony. Proceed.

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MR. SITHER: Thank you, your Honor.

BY MR. SITHER:

Q: Dr. DeGrandchamp, do you have any additional opinions you wish to present here today?

A: Yes, after reviewing the risk assessments that have been conducted for the Metal Bank property, the contaminants that have been detected in various environmental media, I've concluded the risks have been underestimated, due primarily to a lack of very important toxicological data that have yet to be collected.

Q: What have you relied on in forming your opinions?

A: I've reviewed many of the site investigations, of course, I've reviewed the data sets as well as those chemicals which have been analyzed at the property, identified major data gaps. I have also relied on the reports, the expert reports of Dr. Medine and Dr. Diamond, as well as the defendant's expert report, Dr. Anderson, namely. And also I relied primarily, to guide this review process, EPA's guidance that's been specifically developed for PCB contaminated sites. It was developed in 1996.

Q: If you can take a minute, Dr. DeGrandchamp, the Court has heard a lot this week about PCB congeners and PCB aroclor mixtures. Can you review briefly what – how we distinguish those?

A: Well, toxicologists categorize PCBs. Now, I'm going to

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begin by saying, as Dr. Medine testified, PCBs are very complex mixtures of congeners, 209 potential congeners in each mixture, and we define PCBs as very complex mixtures in which we have two types of chemicals, from a toxicological perspective, basically dealing with their potency to produce toxicity.

The first type of PCB congener that we deal with, particularly with aroclor analysis, are nondioxin-like PCB congeners. The second category, of course, is the dioxin-like PCB congeners, which is a small subset of the 209 congeners, roughly 13 congeners, that have a particularly high toxicity associated with exposure and they produce toxic effects with minute quantities.

So we basically distinguish two different categories and evaluate them actually separately in any toxicological evaluation or risk assessment.

Q: You mentioned dioxin. What is dioxin?

A: Dioxin is a very, at one point, I mean perhaps five, six years ago was thought to be one of the most toxic substances known to man. But when we refer to dioxin, the archetypical or the reference congener that we're actually talking about because dioxins are congeners as well, they have a slightly different molecular structure, we're referring to 2,3,7,8-tetrachloro-dibenzo-dioxin, but we – commonly referred to as TCDD, affectionately known as dioxin.

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So dioxin has a very unique ability to produce toxic effects in the body and we use that as a reference chemical for all PCB dioxin-like chemicals because they behave very similarly in the body and they're molecularly related to one another, so they look alike and they act alike in the body in terms of their mode of action.

Q: So what are adverse health effects of PCBs on people?

A: Well, let me start by giving you an overall sense of the toxicity of all PCBs. All PCBs or PCB mixtures, very complex mixtures, aroclors, primarily, can damage the immune system which, of course, is important in immuno-surveillance. That is when you develop a tumor, it's typically your immune system that destroys the tumor and prevents cancer. So it depresses the immune system by attacking it.

The second general effect, toxic effect of PCBs is of course on the developing nervous system in children which can cause cognitive impairment or slight mental retardation.

It also has an insidious effect on the reproductive cycle of humans. That is it can produce stillborns, babies, fetuses, miscarriages, and – excuse me – it can interfere with organ development, liver, kidneys and so forth.

So it has a variety of toxic effects and that's the overall, we call them systemic toxic effects associated with PCB exposure. Now that would apply to both dioxin and nondioxin-like PCBs.

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Q: Do PCBs cause cancer?

A: Yes. And that's our principal focus when we conduct a toxicological evaluation or a human health risk assessment and that gives us the basis for the two classifications.

Dioxin-like PCBs, because they act like dioxin, have a very high or a very great potential for causing tumors or tumor genesis which can lead to cancer. So we distinguish the two different types of congeners in these aroclor mixtures as either having that property of very great potential for causing tumors and those having a slightly different but nevertheless significant ability to cause tumors.

So they all produce tumors but they're different in their potency based on molecular structure, namely what they look like sterically from a molecular standpoint and also from the standpoint of chlorination, the degree of chlorination for each one of these.

Q: In your experience as a toxicologist do you find that dioxin-like PCB congeners are found wherever PCB contamination is found?

A: No. In fact the aroclors having a less number or percentage of highly chlorinated congeners, we're roughly talking about mixtures that span the chlorination percentage or talking about aroclors, we're talking about 1016 through typically 1060 aroclor – excuse me – 1260.

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Of course, as Dr. Medine mentioned, the last two numbers indicate the weight percentage of chlorine. So the weight percentage gives us a relative basis of or relative idea of how potential or the carcinogenic potential of each different mixture.

So, no, I wouldn't expect the same carcinogenic potential to be associated with exposure to, say, aroclor 1016 as I would the congeners up at the higher range of the chlorination scale.

So I would expect to find those congeners that are most potent in causing tumors to be present in aroclor 1254 through 1260.

Q: And how do you know this?

A: There are published reference, literature values basically give you an idea of the relative concentration of each one of these congeners in the four basic aroclor mixtures.

Now, keep in mind, those are synthetic and commercial grade aroclors so once they reach the environment, they change. But Schwartz in '93 has shown that the aroclors that we're particularly interested with regard to the carcinogenic potential are present in aroclors 1254 and 1260, at very, very high concentrations.

Q: I'm showing you Table 1 from or Exhibit 1 from – actually I'm showing you, it's Government's Exhibit 642A-001.

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Can you explain what this chart is?

A: Yes, this is the tabulated results from Schwartz's study in '93 and this is a pretty well regarded study and often referenced study in PCB risk assessments. But the far left column presents the specific aroclor. Each aroclor has a UPAC number, we call it, and it refers to the molecular structure and the degree of chlorination for that particular congener. So, for example, PCB 61 is different from PCB '77.

So we have here from Schwartz's paper a list of those congeners that we're most interested in from a carcinogenic standpoint. As you move to the right, we go from aroclor 1242 to aroclor 1260 and this table presents the concentration of each one of those PCB dioxin-like congeners that are present in those aroclor mixtures.

For example, let's pick PCB 138 to illustrate the differences in the concentration. As we move from aroclor 1242, we know that commercial grade mixtures of 1242, the concentration is 1,090 parts per million. But as we move far to the right with aroclor 1260 we can see that the concentration has dramatic – dramatically increased to 152,000 parts per million.

So this gives us a relative idea of what we can expect out in the field when we want to, when we're analyzing for aroclors, what's behind the aroclor, what's in that aroclor. Yes, so this column illustrates or presents

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Schwartz's findings for PCB 138 across all the aroclors.
Q: Okay, are any of these aroclor mixtures noted at the top present at the Metal Bank site?
A: Yes. Aroclor – primarily aroclor 1254 and aroclor 1260 were detected in numerous locations.
Q: And what does that tell you as a toxicologist approaching the Metal Bank site?
A: Well, the first thing that it tells me is we better shift from aroclor sampling immediately to congener specific sampling because we want to capture the amount or characterize the site with regard to the concentration of these congeners.
So as soon as I go out to a site I would do, I mean routinely I go out to a site, conduct a few aroclor samples because they're cheap, you can expedite the sampling. But once I've gathered the aroclor information at the site with regard to the aroclor number or the chlorine content, I quickly shift over and expect to find some samples that give me an idea of the congener contamination from these 13 specific congeners.
So this gives me an idea of what I should look for and to develop my sampling plan after I find it. So aroclor data are very good for screening a site but they're insufficient to characterize risk.
Q: Okay. So was there congener data performed at the Metal

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Bank site?
A: Limited. We have a limited amount of congener data but with recent trip report prepared by Linda Dietz we do have – excuse me.
Q: Can you explain what – this is Government Exhibit 642A-002. Can you explain this chart?
A: Yes. Again the far left column presents the different aroclors by number, the ones I just described, and Linda Dietz in her trip report presents this table that provides confirmation that indeed these congeners that we're most interested in from a toxicological standpoint are present in the sediment samples near the Metal Bank property. So this gave us confirmation that indeed they are there. So Schwartz gave us a reference point of reference to work from and then this confirmed that indeed these very toxic, dioxin-like PCB congeners are present as part of the contamination presumably coming from the Metal Bank property.
Q: So what is the significance of these data from a toxicological standpoint?
A: The significance is really, it really involves just the toxicological difference between these particular congeners and aroclors in general. These, these congeners pose a significant, a super risk when, especially in environmental conditions where perhaps equilibrium has been reached where PCBs are released into the environment and they reach

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equilibrium, that is between the migration from soil to groundwater. But they've been there for a while and they've weathered.
So the fact that these are there but we don't have a great deal of site characterization dealing with these particular congeners presents a problem for quantifying risk with any precision or accuracy.
Q: I'm showing you Government Exhibit 719. What does this table depict?
A: This shows the significance from a toxi– again, a toxicological standpoint why it's so very important to collect congener-specific data rather than aroclor data. On the far left column we see the toxicity values for 1242 and 1260, and I should just mention that this table was adapted directly from the PCB guidance document that I mentioned earlier.
Q: Excuse me.
(Discussion off the record.)
BY MR. SITHER:
Q: Dr. DeGrandchamp, proceed, continue to explain what this table depicts.
A: We juxtaposed the toxicity values for aroclors which were used in the risk assessments that have been conducted thus far for the Metal Bank facility with those toxicity values that are associated with the 13 PCB dioxin-like congeners.

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These TEF values represents – represent the toxicity equivalency factors relative to dioxin itself. As you recall, I mentioned that dioxin are – dioxin is the standard, 2,3,7,8 tetrachlor-dibenzo-dioxin has a TEF value of one because it's the reference material. A TEF value will give us an indication of how potent these chemicals are relative to it. So that's – that's the definition of the TEF value.
And the World Health Organization has developed a very similar list for the TEFs for – that were developed independent from EPA. So there's general concurrence about these TEF values in the toxicological community.
But what's important to point out in this particular exhibit is that the cancer potency – and again the cancer potency is the ability of these chemicals to produce cancer– is much greater than for the dioxin-like PCB congeners as compared to the aroclors. So if I were conducting a risk assessment, and because risk is directly proportional to the inherent toxicity of a chemical, I'm going to get a much higher risk for, say for example PCB-126 which has a toxicity potency factor of 15,000 as compared to point four and two for aroclor mixtures.
So the importance of this, of this slide I think is obvious with regard to calculated risk, but it's also important for risk assess– or, excuse me, a toxicologist to

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evaluate this because we need to look at cumulative risk and overall health effects associated with PCB sites.

And there were some other problems that perhaps we can get to regarding the aroclor analysis versus congener analysis.

Q: Dr. Medine testified, I think it was yesterday, that once PCBs are released into the environment they change over time as they weather. What effect does weathering have on PCB toxicity?

A: Well, weathering actually produces a super-concentrated soup, if you will, of the PCB mixtures for the very reasons that Dr. Medine went into, the water solubility, the ability of these lower chlorinated congeners to evaporate. They're not going to be there that long and also they're not – they're highly degradatable (sic), whereas the more chlorinated congeners, namely those 13, will stick around for a long time.

So, what you in effect, on a weight-by-weight, you know, comparing weight of PCB mixtures, as time goes on the less toxic congeners simply disappear through vaporization or they're moved away with precipitation, or they're degraded by bugs in the soil, what you're left with is a highly-concentrated dioxin mixture – or, excuse me, a PCB dioxin-like mixture of these higher chlorinated PCB congeners.

So, to summarize, these environmental mixtures are

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much more toxic than the original mixture.

Q: So does this mean that over time PCB contamination at a site will typically become more toxic rather than less?

A: Yes. And the – these particular congeners are highly resistant to degradation. So, once they're in the soil, they're not going to move very far, they're going to be tightly, tenaciously bound to soil organic matter, either sediments or soil, so they're going to stay there for a long period of time because, the higher the chlorination of these congeners, the greater the resistance to degradation, unfortunately for humans.

Q: Are there any other ways in which the fate of PCBs in the environment or transport of them in the environment affect their toxicity?

A: Yes. As these chemicals actually move up through biological systems, as indicated by Dr. Medine, there's a further concentration of these congener – these particularly toxic congeners, because humans or biological systems effectively filter out all the less toxic constituents and they're eliminated from biological systems, whereas the more chlorinated congeners, because they're fat soluble, will be retained in these biological systems. So, each successive trophic level up, reaching fish perhaps, or the ultimate animal eats the fish, which is us, you reach a point where the original mixture may have been increased in terms of its

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potential toxicity by three, fourfold, and that's been shown in the literature, so that's a well-known bio-accumulation effect. So, not only are these things bio-accumulated, but the worst ones are bio-accumulated.

Q: Now, you've been talking about the general toxicity of PCBs, are some people more susceptible to PCB toxicity than others?

A: Yes. In the risk assessment process we are supposed to – it's good scientific practice anyway, but we are supposed to focus on sensitive populations or individuals who may be either predisposed or genetically more susceptible to the toxicity of some of these compounds. The most sensitive group is, by the nature of the toxicity of these PCBs, the developing fetus and a newborn baby. Just to give you a scenario, someone – an angler catches a fish, he goes home, shares it with his family, she's of childbearing age, she eats the fish and the PCBs are sequestered in her breast tissue, because it's an adipose site where these PCBs are sequestered. While she's pregnant, these PCBs can be leached out of that slowly, reach the systemic circulation, and the fetus is exposed in utero, while it's in the mother developing. At that time is when the organ development can be attacked in the fetus. You might have a malformed baby or a stillborn, but if the doses aren't sufficiently high and the term goes to a pregnancy – excuse me, a successful

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delivery, and if the child is subsequently breast fed, of course then he's getting a direct exposure from PCBs. This is exacerbated by a steroid in lactating milk which prevents the elimination of PCBs from the newborn child, so the PCBs will remain in the child longer periods of time than they would if the child was not drinking the mother's breast milk. And also the liver in a child is not fully formed, it's not mature, and there's an enzyme that is not fully developed that will help the child eliminate the PCBs from the body, the glucuronidase in the liver.

So, the child is predisposed from several different – for several different aspects. But I would say, far and away, the child, the fetus or the lactating newborn is the sensitive population that we have to be concerned about.

Q: What other sensitive populations are there?

A: Well, of course, as recommended in the fish advisory, any fish advisory I've ever seen, cautions against women of childbearing age to not eat contaminated fish, whether it's mercury or whether the contamination. So she would certainly fall into that category, but it would ultimately affect the fetus. But there's another group that may not even know that they're aware of their predisposition to these toxic effects and that includes anyone who has had their liver function altered either through alcohol, drinking alcohol, which can cause liver damage of course, but hepatic viral infections,

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hepatitis C, B, or medications that alter the liver function, because we ultimately use the liver to remove PCBs from our body. So, if that's – if the liver function is altered, then those people would be predisposed.

Q: How long do PCBs remain in the body once they get there?

A: Decades. And, unfortunately, those more chlorinated congeners remain more than all the others because they're more fat-soluble, it's a simple physical, chemical property associated with the chlorination, the degree of chlorination. So, while we may get rid of the less toxic, the more soluble types of PCBs, those PCBs that can harm us the most are retained in the body for perhaps decades. That's why it's important to conduct a risk assessment even when you only have a brief exposure to the site to be very careful because, once these PCBs get into the body, they're not eliminated very quickly, so you will have a chronic exposure to PCBs even after you go away from the site. So that is probably one of the confounding factors of these risk assessments as well.

Q: Dr. DeGrandchamp, you stated that you have an opinion that the previous risk assessments have underestimated the threat to human health from contamination at the Metal Bank site, what is the basis for this opinion?

A: Well, I based that opinion primarily on the lack of data that we have currently to use in a quantifiable manner to

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estimate the health hazards. The first omission, if you will, is – was described by Dr. Medine yesterday. Overall, the PCBs have been underestimated at the Metal Bank facility, primarily because of the Aroclor analysis that was performed to measure the amount of PCBs in samples. As he showed in his chromatogram – chromatograms, I think that's plural, he showed an example where the PCBs were indeed there in that sample, but they were reported as nondetects, and that goes to this weathering issue. Once the characteristic peaks are missing from the original commercial Aroclor that's released, you can longer identify it, and if you're only asking for the Aroclor analysis, if that Aroclor is not there, it's going to be reported as nondetect most often.

Q: I'm showing you a Table 432, which is from the remedial investigation, which is entered into evidence at Government Exhibit 494, can you explain what this table portrays?

A: Yes, this is just a simple example to illustrate this concept. This is from the RI that I happened to notice as I was going through the biological data for this site and we're looking at the PCB concentrations for corbicula, the clam, where there were parallel analyses conducted on each sample. The clams were collected at Mud Flat Area 5 through Mud Flat Area 11. And what is important here is to notice that when the Aroclor analysis was detected – or, excuse me, when the Aroclor analysis was conducted on these samples, we have

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reported here nondetects, ND represents nondetect in these samples. So, here we have a case where if I only saw that particular row in the data summary I would presume there were no PCBs in these clams, therefore no risk. However, when you look at the parallel analysis conducted for the congeners – and, again, that's what we should be going after now that we know that Aroclor 1260 is present at the site, indeed we do have congeners present in the same samples.

And I'd just like to point out one other thing about this data – of course, now this is an inference from the data, but because we know the more chlorinated PCBs are accumulated, we call it bio-accumulation, in biological systems, it's likely that those congener results represent the worst or the most toxic PCB congener at the site simply because they're retained in biological tissues, just based on the virtue of their physical chemical properties.

So, I think the two – you asked me about the underestimation of risks, I think this is a clear case where we would have in the risk assessment, if we just used the Aroclor data, we would be underestimating risk. So, fortunately, in this case there was some congener data that were available.

Q: Are there any other ways in which human health risks have been underestimated at the site?

A: Yes. As Dr. Medine pointed out yesterday, in reading the

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chromatograms 1268, Aroclor 1268, was reported at the site in terms of the chromatograms, he read – I think he showed the peak, indicating 1268 was present in samples, but it was never reported and it certainly wasn't used in the risk assessments to estimate risk.

Now, that has two implications, the first being total PCBs have been underestimated, just the mass of PCBs have been underestimated, and the second deficiency, if you will, is that because Aroclor 1268 likely has a greater inherent toxicity than Aroclor 1260, because we're dealing with 60 percent chlorinated congeners versus 68 percent by weight, it's likely that the Aroclor 1260 presents a greater toxicity for the exposure scenarios that were envisioned in the risk assessment.

So, the risk assessments that I saw did not use any Aroclor 1268, primarily because it wasn't reported in the RI data summaries.

Q: Are there any other ways in which risks have been underestimated by previous risk assessments?

A: I think the greater source of underestimation goes back to my earlier comments about the PCB dioxin-like congeners not being specifically analyzed. If you don't analyze for those PCB dioxin-like congeners, due to their – their significant inherent toxicity, you're just simply not going to capture all the risks out there. And I juxtapose the

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cancer potency factors for that subgroup compared to the toxicity values that were used in the risk assessment for the Aroclors and there's a significant difference. What that means is you can have a very small amount of the dioxin-like PCB congeners at a site and, even if it's a minute amount, it can still pose a significant risk.

Q: Have the risks from dioxins themselves been assessed by previous risk assessments?

A: Yes, and that's been not an oversight on anyone's part, except for the samplers, but there's just limited data for dioxins and furans, which – when you typically conduct a risk assessment you look at the operational history of the site and when typically I see a PCB site and I know there's been combustion, whether or not they were burning PCBs, you can get contamination of whatever you burn just by virtue of it being at the site, I would have requested some dioxin and furan samples.

Now, of course, dioxin has the greatest toxicity of this whole class. And we have a few samples that indicate the presence of dioxin and furans, and that was reported in the RI, but there's insufficient data right now to characterize the risk. So, it wasn't really a deficiency in the risk assessment and I don't think the site has been well characterized with regard to those, those compounds.

Q: Now, did you come to your opinion by performing a human

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health risk assessment?

A: No, no. Typically, when I need to take a risk assessment at a site, I'm trying to quantify risk –

THE COURT: Hold it just a minute. He said no.

MR. SITHER: Okay.

BY MR. SITHER:

Q: Can you explain why you didn't perform a risk assessment?

A: Yes. I didn't perform a risk assessment because I think it would have – owing to the large data gap – data gaps that I see in both the analyses that were performed and the gaps in site characterization, with regard to now the most toxic constituents – certainly the nature and extent can be evaluated in terms of where these contaminants are and where they're moving, but to perform a risk assessment with any precision or accuracy I want to reduce the uncertainty in the risk assessment to the greatest extent possible so that it has some value.

So, I didn't perform a risk assessment because ultimately I concluded that the data simply weren't there, but there were indications, primarily with the latest data set that Linda Dietz collected or generated for the site back in June, 2002, that these toxic chemicals are indeed there, but I don't know the extent, I don't know the contamination. What I can say is that these levels are above de minimus risk levels, de minimus meaning in the scientific community

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insignificant. So, compared to standard EPA and ATSDR, the Agency of Toxic Substance Registry, they are there above de minimus risk levels; I can't quantify how much more they are there above de minimus risk levels, but that simple comparison convinced me that they were – they may pose a risk or a health threat.

Q: Didn't the defendants' expert, Dr. Anderson, perform a risk assessment and quantify the risks?

A: Yes.

Q: Okay. And do you – why do you – do you disagree with her conclusions?

A: Yes, I do. Not casting any aspersions on Dr. Anderson's report, but the data simply, once again, aren't there. She has not calculated the risks to human health posed by these dioxin-like PCB congeners for the very reasons I mentioned regarding the lack of data base – or the lack of data in the date set that she used for the risk assessment, there is no dioxin-like risk calculated, even though now we know dioxins and furans are present at the site, there's no PCB dioxin-like risk calculated. Moreover, she didn't use the protocol or the paradigm that has been developed specifically for PCB-contaminated sites, namely the 1996 U.S. EPA guidance that provides very detailed steps to take in calculating risk, so that at the end you've got a tenable risk assessment that's defensible. She used a different protocol, a slightly

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different protocol, and in addition it didn't follow the recommendations that were recently issued by the National Research Council where Aroclor analysis is strongly discouraged at PCB-contaminated sites for the various reasons that I've mentioned here.

So, she didn't follow the paradigm – that's not to say that you have to get the blessing from the agency that you're working for to conduct a risk assessment, but at this point I don't think the approach she has used is appropriate, and I think the data set that she used is insufficient and doesn't characterize the site, so, correspondingly, it doesn't characterize the risk at the site.

Q: Okay. You've talked about your opinion, the basis of your opinion that the risk at the site had been underestimated, what is the basis for your opinion that the site poses a potential threat to the health of people who, say, eat fish caught near the site?

A: For risk to exist, impose a risk to those populations who live nearby, you need basically two things: You need the chemical to be there in sufficiently high quantity, that is, the concentration has to be sufficiently high, the chemical has to pose a risk due to its inherent toxicity, but you also need that second component, you need people to be exposed. If chemicals are there sitting in the woods and no one is coming in contact with them, you can't come up with a

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plausible or reasonable risk estimate simply because no one is going to be exposed. So, you need the concentration and you need the exposure.

Now, in evaluating the data sets that have been generated at the Metal Bank site, I was convinced that they're sufficiently high and those chemicals that pose a high toxicity are there at concentrations that pose risks if someone comes in contact. So, it was important for me to actually go out and make a site visit to confirm my belief that exposures could – were plausible or were actually currently occurring.

In a risk assessment, we are supposed to conduct a risk assessment under both current exposure conditions and future conditions, we're supposed to anticipate through land use analyses, study of zoning records, what types of exposures can occur in the future, assuming reasonable regional conditions, economic development, if it's a very valuable piece of land we can expect this type of exposure. So, I went out to the site to convince myself that someone is going to come in contact somehow with these contaminants.

Q: And did you see evidence that people would come into contact with these contaminants?

A: Yes. We had the opportunity to go out with the Fish and Boat Commission to view the site from the river side and on our way, serendipitously, we probably traveled down about a

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mile so, and we were probably approximately a mile from the Metal Bank property, and we came upon two fishermen who had just landed a ten-pound carp. So, we got out of the boat – I wanted just to have an informal conversation with these fishermen, and I have to tell you this, this was serendipitous because I've been out on 50, 60, 70 site visits – typically it's not necessary for me to make a site visit at a hazardous waste site, because I can usually predict from the confines of my office what's going to happen there or what is happening, but I have been out to site visits before, this is the first time I've ever seen anyone land a fish, so I wanted to get out and talk to them.

MR. MATTIONI: Objection, your Honor. He was not at the site by his own admission, how he can say he was, I don't know.

THE COURT: Overruled. So, what fish story was given?

(Laughter.)

THE WITNESS: It was a big one. I walked out to these two gentlemen and they just landed – we didn't weigh it, but it looked like a ten-pound fish. And I asked the one guy who actually caught it if – how often he fished there, so I was trying to gather some frequency exposure information.

THE COURT: Fish where? Were you at this point a

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mile downriver or upriver from this site?

THE WITNESS: Downriver. We were coming towards the site, it was approximately about a mile away from the site. I just wanted to get a general idea of the fishing habits and activities, not necessarily associated with Metal Bank, but I wanted to know essentially if they ate these fish.

BY MR. SITHER:

Q: What kind of fish was it, Dr. DeGrandchamp?

A: It was a carp, it was a big carp. I –

THE COURT: Ten pounds?

THE WITNESS: Ten pounds.

(Laughter.)

THE WITNESS: Well, I don't know, is that – I don't know if that's a big fish in this area, where I come from it's a big fish.

BY MR. SITHER:

Q: What were these fishermen going to do with this carp?

MR. MATTIONI: Objection.

THE COURT: What were you told? Overruled.

THE WITNESS: I was told by the one fisherman that he did not eat fish, he just enjoyed fishing, getting away, while the other gentleman was holding up the fish proudly, telling me that he was going to go home and eat it. So, I asked him if he shared it with his family, if he had a family. I didn't want to intrude too much, but I thought it

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was important for me, first of all, to see if that sensitive population that I just discussed was going to be exposed, I mean, that was my – that was my real interest. So, I asked him and he said, yes, I – my children don't like it, but my wife likes to eat carp. So, I asked him if he – how he prepared it. He said, I'm just going to cut off the head and eat it, bread it and eat it. And I asked him if he was going to trim it, you know, eat the fillets, and he kind of laughed at me. And that was important from an exposure standpoint because, even according to the advisories that are attached to their licenses, they're instructed to cut away the fat on the underside of the fish which contains the PCBs, that's where the PCBs accumulate, but he proceeded to tell me he was going to eat the fish pretty much in toto. So, that was interesting. And I don't know how old his wife was and I didn't feel like giving him any professional advice at that point about it.

But that gave me two valuable pieces of information to complete this exposure assessment that I was doing informally, conducting informally: First, people are not observing those fish advisories –

BY MR. SITHER:

Q: And why aren't they observing the fish advisories?

A: Well, because they're eating the fish. He gave me the impression he was going to eat that whole fish within a

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couple days and the fish advisories recommends a half a pound a month. The second piece of information that's very important from a toxicological standpoint is he was going to eat the fat, he wasn't going to trim the fat away, so apparently he didn't read the fish advisory very closely.

Just to finish this fish story, if I can, we just traveled down a bit further and talked to two more fishermen who told us indeed they were having a great time out fishing, but they weren't going to eat the fish. But then they said, as we were moving away, a lot of people eat this fish. They come down over the weekend and they're typically of the lower social economic strata, unfortunately, so that may be a particularly sensitive population out there.

But what I concluded from my site visit was that indeed this exposure pathway that I presumed in the confines of my office were indeed complete and that's what we're looking for in a risk assessment, so that was very important. So that was a piece of information I used to base my decision – or my opinion on. And the second piece of information I used was I had an opportunity to drive around with Linda Dietz, who was kind enough to drive me around the neighborhood, because that's the other thing you want to look for at a site like this to see generally if there are any developmental pressures to develop the site, if they're – how expensive the property is, who lives around that region.

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Q: Why is this relevant?

A: It's according to EPA guidance actually. We're supposed to conduct a future land analysis according to RAGS, Risk Assessment Guidance for Superfund, affectionately known as RAGS. But the guidance instructs us to evaluate future exposures at the site by conducting either a formal or informal future land use analysis. Now, of course I didn't have time to conduct an exhaustive analysis for future site conditions, but I learned through our drive-around and what Linda Dietz could inform me of the developmental pressures around there that this property could become valuable. It's only interesting from the exposure standpoint for this following reason: If development occurs out there, we are supposed to take into account the type of exposures that could occur either during construction, redevelopment, or after construction is completed. I'm presuming, based on my expert opinion, that development will occur and, if that occurs, there's likely to be some disturbance in the soil, excavation for footings, foundation walls. And once you expose that soil, the PCB-contaminated soil, you have one of two options that I can see: If you excavate down to the level where the PCBs are currently protected from exposure and bring them to the surface, that soil could be used for backfill against the foundation of these new buildings –

Q: And why is that significant?

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A: Well, because then there's a direct ex – you're bringing the PCBs to the surface now and you have direct exposure potential for those future workers on the site who may be at the site eight hours a day. So, right now there is no – I have to conclude there is no current exposures, but if the land is developed in the future, even if there are deed restrictions, remember these PCBs are – they're going to resist degradation out there for a long period of time, they're going to be out there for decades. So that is a plausible future exposure pathway, but I have to caveat that with it's a potential, it doesn't exist currently.

So that's what I concluded from my site visit, so I think I gained a lot of valuable information.

Q: So, are the opinions you're expressing here today expressed with a reasonable degree of scientific certainty?

A: Yes.

MR. SITHER: No further questions, your Honor.

(Pause.)

MR. SITHER: I'm sorry, one moment. Your Honor, may I offer these exhibits into evidence that we used?

MR. MATTIONI: There's no objection. You can read the numbers, I suppose.

MR. SITHER: Okay. Exhibit 642A-001, 642A-002, 642A-003, 719, and that's it.

THE COURT: They're admitted.

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(Government's Exhibit Numbers 642A-001 through 642A-003 and 719 received in evidence.)

THE COURT: Are you ready to proceed, Mr. Mattioni?

MR. MATTIONI: I'd like to have about five minutes, if I can, your Honor.

THE COURT: Five minutes. You're free to step down, sir, if you choose.

(Court in recess; 2:18 to 2:29 o'clock p.m.)

THE COURT: Please be seated.

Mr. Mattioni, you may proceed, sir.

MR. MATTIONI: Thank you, your Honor.

(Pause.)

CROSS-EXAMINATION

BY MR. MATTIONI:

Q: Dr. DeGrandchamp, from what you've just said about the lack of data sufficient to do an adequate quantitative risk assessment, human health risk assessment, does that mean that whatever risk assessments have been done in the past are inadequate?

THE COURT: Inadequate for what purpose?

MR. MATTIONI: For quantifying human health risk.

THE WITNESS: I'd label them interim. Based on the available data, they're probably fairly accurate, but based on the likelihood of the presence of more toxic chemicals that have been ignored thus far, I would say they don't

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characterize the true risks associated with the site.

BY MR. MATTIONI:

Q: Now, is it always true that if you do a congener analysis that levels of dioxin-like PCBs are going to be higher rather than lower?

A: Relative to what, higher –

Q: Relative to the Aroclor analysis that you're saying is inadequate here?

A: Well, first, I think the Aroclor analysis is inadequate in itself, we're getting nondetects when PCBs truly exist in those samples. So, the Aroclor analysis is underestimating the risk because we're concluding there is no contamination when there truly is in a particular location. But, yes, based on my experience, when you introduce congener-specific analysis into the site characterization you do have higher risk and it does – it doesn't take much.

Q: Of course, up until very recently, and in fact maybe even continuing today, isn't it a fact that most if not all risk assessments have been based on an Aroclor analysis?

A: Well, the science of risk assessment evolves like any other science, but since 1996 EPA has a stated position that Aroclors cannot – Aroclor data cannot precisely estimate risk or relying on Aroclor data, in fact their 1996 guidance strongly suggests or discourages one from using Aroclor data because the congeners within the Aroclor mixture change so

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much through weathering that the original congener mixture is no longer recognizable.

Q: Dr. DeGrandchamp, my question really was – and let me state it again – isn't it a fact that even beyond 1996 and including up to today most human health risk assessments are based on EPA guidance which does not mandate or require congener analyses but instead does the risk assessment on the basis of Aroclor analysis?

A: I think there are two questions there. First, are most risk assessments conducted with Aroclor?

Q: Well, answer that.

A: Yes. I would say there are a fair amount that do conduct – that are conducted based on Aroclor data, yes.

Q: Isn't that the bulk of the risk assessments that are currently being done using Aroclor analyses and not congener analyses?

A: Not in my experience and that's why I'm actually writing the guidance for the Bureau of Medicine, so that risk assessments can be performed better. As I mentioned, the science is evolving, we have analytical techniques now that were not available five years ago and n ow we can conduct congener analysis with the precision and accuracy that's needed with the type of risk assessments that are conducted. But, yes, historically I would agree, Aroclor analyses were conducted to perform human health risk assessments.

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Q: I guess you've said they're routinely – were routinely done on an Aroclor-analysis basis and does that mean now that the EPA is going to have to go back and reopen every Superfund site involving PCBs to do a whole new risk assessment on a congener-analysis basis?

THE COURT: For what purpose?

MR. MATTIONI: To do a risk assessment, to find out if they were wrong.

THE COURT: Well, my understanding of the testimony is that it's his opinion that the risk using the Aroclor approach shows that the site is bad and if you use a congener analysis it will likely show that it's much worse than had been previously thought, am I right?

THE WITNESS: Yes, that's correct.

THE COURT: So, when I say for what purpose, is it for the purpose of assessing – determining liability, whether there's a substantial risk, or is it for the purpose of remediation? That's the thrust of my question. So, rephrase.

BY MR. MATTIONI:

Q: Is it your opinion that the assessment of risk, in this case by – well, by EPA, let's say, is adequate to determine what should be done at the site?

A: I'm not qualified as a risk manager, I'm a toxicologist, so decisions about remediation at heart are about protecting

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the public, but –

Q: But you're not qualified, you said?

A: Not as a risk manager.

Q: Thank you. Part of what you said, I guess, is – if I understood or followed you correctly, part of your belief that this Dr. Anderson's risk assessment was inadequate was because of this finding that there was Aroclor 1268 in some of the samples that was not analyzed separately?

A: Is that a question?

Q: Is that correct?

A: Could you repeat the question?

Q: Did I understand you correctly in faulting Dr. Anderson's risk assessment because some of the Aroclors, Aroclor 1268, that you say were found were not reported?

A: I'm not condemning her report, she used the available data, and she used a very specific data set, which was another flaw that I didn't mention, but she used the most recent data set to characterize risks. According to EPA guidance and good standard risk assessment practice, you calculate the lifetime risk from the point at which those uncontrolled releases were released in the environment, not at some arbitrary time where you would select a specific data set that's the most recent data set simply because it's the best data set.

So, I would say I don't think she intentionally

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overlooked that data, but it was never reported in the RI report in the data summary. So, I don't think it was an intentional omission on her part but, because it wasn't incorporated into a risk assessment, yes, I believe that the risks were underestimated.

Q: Are you assuming then that Aroclor 1268, because it has a higher percent chlorine by weight, necessarily has more dioxin-like congeners than, let's say, 1260 or some other Aroclor?

A: That's my suspicion, yes.

Q: Have you done any research on that issue?

A: Yes – well, I have found little in the scientific literature –

Q: Did you find anything?

A: No, except –

Q: Just –

A: I'm sorry, except to state that the general tendency in all the peer-review publications that I've read that as the chlorine content is higher, with few exceptions, the general tendency is for the toxicity of those to increase. But, no, I did not find any specific literature references to Aroclor 1268.

MR. MATTIONI: May I approach the witness, your Honor, and hand him an exhibit? It will be Defendants' Exhibit 1107.

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(Pause.)

BY MR. MATTIONI:

Q: Dr. DeGrandchamp, are you familiar with an Irving Sax and his publication, "Dangerous Properties of Industrial Materials"?

A: Yes, in graduate school.

Q: And –

A: Not since that time though.

Q: Pardon me?

A: I haven't looked at this since that time, no.

Q: Did you actually find any reference to Aroclor 1268 and its –

THE COURT: Well, let's find out –

BY MR. MATTIONI:

Q: – congener analyses?

MR. MATTIONI: I'm sorry, your Honor, I apologize.

THE COURT: Well, let's find out if he recognizes this document as an authoritative publication.

BY MR. MATTIONI:

Q: Dr. DeGrandchamp, do you recognize this – I've only given you a couple of pages of it, but Irving Sax's Fifth Edition of the "Dangerous Properties of Industrial Materials"?

A: Yes.

Q: Is that a standard text in the – in your field?

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A: It's a good reference document for acute exposure to chemicals.

THE COURT: Are you making a distinction between acute and chronic?

THE WITNESS: I can only speak, your Honor, in the context that I have used this document to gather information like lethal concentrations, those acute exposures that can occur. So, I've only used it in one context, so – but I know it's authoritative in that context.

BY MR. MATTIONI:

Q: Could you turn to – I guess it's in the copy I provided you, Dr. DeGrandchamp, it will be Page 484.

A: Mm-hmm.

Q: Does Sax set forth on that page information concerning chlorinated diphenyl Aroclor 1268?

A: Yes, it does.

Q: And does he also include in that same document a number of other Aroclors?

A: Yes.

Q: Starting, at the top of that page at least, from 1232 down to 1268 and there's a few more beyond that?

A: Yes.

Q: How do you read this listing, for example, when it says, "Aroclor 1260, acute toxic data, oral LD-50," in parentheses, "(rat) equals 1315 milligrams per kilogram," does that – can

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you tell us what that means?

A: Yes. The oral LD-50 is the dose on a probit scale that causes 50 percent of the rat population under study to die, that's the acute toxic data. That refers to a 24-hour exposure unrelated to cancer, the topic or the point of the risk assessments, but according to this table it lists the acute toxic data, of which we don't use in a risk assessment, quite frankly, but –

Q: I understand, I'm just –

A: Yes, yes, I see that.

Q: But that – it lists 1300 – 1,350 milligrams per kilogram as the acute toxic data oral LD-50 for a rat?

A: Yes.

Q: If you drop down to 1268, that lists acute toxic data, "oral LD-50 (rat)," as equal to 10,900 milligrams per kilogram?

A: That's correct.

Q: At least for measure of acute toxicity, does that suggest that Aroclor 1268 is less toxic than Aroclor 1260, at least for the LD-50?

A: No.

MR. SITHER: Objection.

THE COURT: Overruled. Explain.

MR. SITHER: Your Honor –

THE COURT: No, the witness explain. The answer was

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no, explain your answer.
THE WITNESS: No, it – it refers to just the opposite. From this table, it takes more Aroclor 1260 to produce a toxic dose than it does 1268.
BY MR. MATTIONI:
Q: In other words –
A: The lower the toxic dose – the lower the toxic dose, the more potent the chemical.
Q: Correct.
A: Yeah. Was I comparing the wrong one, 1260 –
Q: No – for chlorinated diphenyl Aroclor 1260, the LD-50 is 1,315 milligrams per kilogram.
A: My mistake, I was reading 1262. I'm sorry, yes.
Q: And –
MR. SITHER: Objection. Your Honor, I notice from the date of this treatise, it's on the second page, it's copyright 1979 and I'm wondering if Mr. Mattioni has a more recent version of this.
THE COURT: Well...
MR. SITHER: I don't know if it's proper to cross-examine with an outdated treatise, if there's anything –
MR. MATTIONI: I'm not sure that it's an outdated treatise, your Honor.
THE COURT: Well, let's – well, you're not sure it is.

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MR. MATTIONI: Well, if your Honor –
THE COURT: Well, whatever it is, I'm going to permit the witness to continue to help me understand the equation. Let's go back to 1260.
THE WITNESS: Yes.
THE COURT: Explain – I know what acute means, that means to kill off the animal.
THE WITNESS: Yes.
THE COURT: So, is that dosage of 1315 milligrams per kilogram that it would take to kill off 50 percent of the rat population in the study?
THE WITNESS: Precisely.
THE COURT: And that's by oral ingestion?
THE WITNESS: Yes.
THE COURT: And then dermal in rabbits is what?
THE WITNESS: You typically shave the animal's back and apply this – a topical solution to the animal.
THE COURT: At 2,000 milligrams?
THE WITNESS: Correct. That's body weight, not our typical terms of concentration in environmental media, but, yes, at that concentration.
THE COURT: What is the legend in the two lines below mean, THR equals MOD, do you know what that means?
THE WITNESS: Probably therapy equals... you know, in this particular case... no, I don't. It gives different

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references here for those two, but I don't know what those particular acronyms refer to in this.
THE COURT: Now, Mr. Mattioni's question was whether or not there was a suggestion of something, I'm directly you to answer only if you have an opinion to a reasonable degree of medical certainty as to whether you know that – whether you have an opinion to a reasonable degree of medical certainty of the significance of the 1315 to 1260 and 11,300 for 1262, do you know?
THE WITNESS: Yes.
THE COURT: What is your opinion?
THE WITNESS: My opinion is that 1260 is acutely more toxic than 1268, the acute toxicity, the relative acute toxicity between those two Aroclor mixtures, in that particular comparison, yes.
If I could elaborate?
THE COURT: You may.
THE WITNESS: Okay. This is irrelevant to a human health risk assessment because this pertains to chemicals causing death within 24 hours of the dose being given. This has no relevance to cancer formation or tumor formation and development of cancer. And I'll give you a good example, dioxin acutely is extremely non-toxic – or it's not extremely, it's non-toxic in some instances, but it's a very potent carcinogen. So, because something is acutely toxic

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does not necessarily mean that it's a potent carcinogen. In fact, cyanide is not a known carcinogen, but it can cause death immediately. So, there's really no relationship between acute toxicity and development of tumors or characterization of a compound as a carcinogen. But I will agree that this table shows that you need a lower dose of 1260 to kill 50 percent of the animals.
THE COURT: Within 24 hours?
THE WITNESS: Within 24 hours. And I would also note here that if you look at these Aroclors there's no general trend anyplace within this table with regard to the toxicity of these chemicals, that is there is not an increase in acute toxicity as you add more higher chlorines to the mixture. So, we wouldn't use this information, quite frankly, in a risk assessment where we were estimating risk for long-term exposures.
BY MR. MATTIONI:
Q: Dr. DeGrandchamp, you are familiar with the document published by the National Center for Environmental Assessment, U.S. Environmental Protection Agency, entitled, "PCBs Cancer Dose Response Assessment" –
A: Yes.
Q: – "An Application to Environmental Mixtures," September, 1996?
A: Yes.

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Q: As a matter of fact, is that something you referred to?
A: Yes.
Q: Let me take you to take a look at some pages from that document.
(Pause.)
Q: Dr. DeGrandchamp, I think you've said in your testimony that the higher the chlorine percent by weight the more toxic the mixture, right?
A: Generally, with a few exceptions, and this pertains to that exception, yes.
Q: Well, then I'll refer you to the bottom of Page 39 of the exhibit, Defendants' Exhibit 1108. Would you read for the Court that – beginning with the word, "Chlorine content"?
A: Yes. "Chlorine content was formerly regarded by some scientists as correlated with cancer risk. Recently, however, Aroclor 1254 was found to be more potent than 1260, which is only slightly more potent than 1242, the Brunner study. This casts doubt on chlorine content being a useful indicator of cancer potency in this range of chlorine content. Both the number and position of chlorines are important."
Q: Could you read the rest of it, please?
A: Yes. "It is instructed to compare how the Aroclors rank by other measures with respect to resistance to metabolism, persistence in the body. There is an association with

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chlorine content which partially explains the greater experimental potency of commercial mixture with higher chlorine content."
Q: Read on, please.
A: "With respect to dioxin toxic equivalents, however, several studies have ranked 1254, 1248 and 1242 as more potent than 1260."
Q: You can skip the references –
THE COURT: Well, read the rest of it, please.
BY MR. MATTIONI:
Q: – but read the rest of it.
THE COURT: "The combined..."
THE WITNESS: "The combined effect is difficult to predict as Aroclor 1260 mixtures with higher chlorine content have lower dioxin TEQs but persist longer in the environment and in the body."
BY MR. MATTIONI:
Q: Now, you've explained something about PCBs and PCB congeners, and you've referred to at least in the context of cancer potential that the higher the chlorine percent the more likely you're going to have the dioxin-like congeners?
A: Well, I used the shorthand: The more of those dioxin-like PCB congeners in the mixture, because they have a higher chlorine content, they're going to have greater potency.
Q: Now, I notice that you use as a reference for your

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dioxin-like congeners the Schwartz publication, was that it?
A: Yes.
Q: And that was in 1996, you're saying, according to the exhibits –
A: Yes.
Q: – that you had?
A: No, Schwartz, I believe, was 1993.
Q: Oh, okay. 1996 was your Exhibit 719, I guess. Do you have that still there?
A: I'm sorry, what exhibit was that?
Q: 719, Government's Exhibit 719.
A: Yes, this is from the Schwartz – excuse me, is this the exhibit you're referring to? No, I think we're looking at the...
Q: I'm looking at 719, which says, "Source TEF derived from U.S. EPA, PCBs Cancer-Dose Response Assessment," September, 1996?
A: Yes, yes.
Q: Hasn't there been further development by EPA in which they have accepted as recently as either 2000 or 2001 the World Health Organization's determination of TEF, the toxic effects – toxic equivalent factors?
A: In general, I believe with one exception, they have. However, if I can qualify? EPA is currently reevaluating the toxicity of dioxin, the reassessment report is expected out

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some time this fall, in which I have been told by EPA personnel involved in the reassessment not only will dioxin be considered more toxic, but some of these toxicity equivalency factors will be changed. So, my conclusion is, my answer to you is this is in flux.
Q: In the latest version of the draft final document that you're talking about did EPA not reduce the number of toxic congeners to 12 rather than 13 or 14?
A: Yes.
Q: And at the same time, when they did that they determined that the TEF, the toxic equivalency factor, for two of the congeners was in effect dropped and reduced to zero?
A: Yes.
Q: And a couple of others were also reduced at the same time?
A: Yes.
Q: So, what you're saying is that at the moment you don't know what's going to happen, so you don't know which TEFs are going to apply to what congeners?
THE COURT: Well, were they reduced to the level of non-toxicity? That's what I want to know.
MR. MATTIONI: Well, two of them were.
THE COURT: Well, let me ask.
MR. MATTIONI: I think he answered that two of them were, your Honor, he agreed with me.

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THE COURT: And what were they, do you know?
THE WITNESS: I don't recall precisely which ones were dropped. But if I can just elaborate on this table, just to make a point. As you can see from this table, even when this was prepared in 1996, some of these PCB congeners – I didn't want to indicate that all of them have a significant toxicity – the last two, for example, have a toxicity of 1.5, which is less than the total Aroclor mixture. So, yes, the science is in flux. I don't know what significance it would have in terms of the risk estimate, but typically, speaking from my experience, when things change slightly it doesn't have a significant difference on the risk assessment, but I can't say that for certain without conducting that.

BY MR. MATTIONI:

Q: Well, let me ask you, Dr. DeGrandchamp, when you make a statement like that, the TEF is not a standard itself, correct? The TEF is a factor that has no – I mean, it's not milligrams per kilogram or something like that?
A: Correct.
Q: It's a number that is used to take a congener, and in essence you take the TEF and you're going to multiply it by something to get the equivalent of this TCDD, and of course, since you're doing it for each individual congener, isn't it true that the individual numbers once you've done the

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mathematics are what count?
A: Yes, that gives you an equivalent weight of dioxin-like effects, yes.
Q: But it's not until you do that conversion that you know what – for example, if you took a sample, you analyzed using the congener analysis, and you wanted to know what's the – what's the term you use for when you do that mathematics, what do you get at the end?
A: A TEQ.
Q: That's the toxic equivalent and that is stated in some–
A: Yes.
Q: – parts per billion, parts per trillion, whatever it might be?
A: Yes.
Q: And of course one would expect then to see, once you've done the TEQ mathematics, to see for each one relatively smaller numbers than a number that translates into the whole, if you follow what I'm asking?
A: Yeah, it depends on what TEFs change. I can give you an example, I just completed a risk assessment two weeks ago and I had to use the WHO values, the World Health Organization values of the TEFs, and EPA's, and it came out as a wash, there was no difference in the estimated risk for this particular site. So, in some instances I would agree that if the TE – for example, if the TEF changed for PCB-126,

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certainly that would have a significant impact on the overall risk assessment, but it depends on the site and the relative proportion of these PCB dioxin-like congeners in the sample. Keep in mind, I only showed you the PCB dioxin-like congeners and not dioxins themselves, which I didn't include on this table, but we've detected dioxins. So, included in your TEQ value would be the dioxins and furans, which would add to this overall TEQ that you mentioned.
Q: Okay. But not all of dioxins are alike either, isn't that correct?
A: Correct, they have congeners –
Q: You've got the TCDDs –
MR. MATTIONI: – and, your Honor, because I couldn't possibly pronounce what that stands for, I'm going to use the acronym, but that's –
THE COURT: I'll accept that, Mr. Mattioni.
MR. MATTIONI: I'm having trouble getting words out, let alone those kind of words.

BY MR. MATTIONI:

Q: But the TCDDs, that's the – sort of the – that's the one that has a TEF of 1?
A: Yes, correct.
Q: And when you look at those congeners for the dioxins themselves, they have these TEFs just like the dioxin-like PCB congeners, I take it?

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A: Yes, yes.
MR. MATTIONI: You'll bear with me, your Honor, this is not easy stuff for me.
(Pause.)
MR. MATTIONI: If I may approach, your Honor?

BY MR. MATTIONI:

Q: Exhibit Defendants' 1109. Dr. DeGrandchamp, would you take a look not at the first page there, but the second page, which is – oh, I'm sorry.
(Pause.)
Q: There's a copy of an article published in the Journal of Analytical Toxicologist in May-June, 1981. Are you familiar with the Journal of Analytical Toxicology?
A: Yes.
Q: Is that an authoritative peer-reviewed publication?
A: Yes.
Q: Are you familiar with Mr. Safe, L. Safe or Dr. Safe?
A: I'm familiar with Steven Safe's work, yes.
Q: And have you seen a copy of this article previously on "Synthesis of the Octen (ph.) and Non" – I quit – it's a "Non-a-chlorobiphenyls (ph.) Isomers and Congeners"?
A: Yes – have I seen it? No.
Q: Would you take a moment to read the portions of that document which refer you to the congener analysis of Aroclor 1268?

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A: I'm sorry, where would that be?
Q: Well, on the front you'll see there's a table which shows the –
A: Oh, on this? Okay.
Q: – 1268, 1262, 1260.
A: Okay. And, I'm sorry, what did you want me to read?
Q: Well, I'd like you to satisfy yourself that in fact that's a copy of a table showing the author's determination of the congener – congener analysis of Aroclor 1268.
A: The top is cut off, I can't – but I presume this is the Aroclor that you're referring to – these are Aroclors 1268 and others, yes.
Q: By looking at that list with – I take it, on the left-hand side where it says, "Peak number" – is that still in your copy?
A: Yes.
Q: There's a list of numbers, it starts at 194 –
A: Mm-hmm.
Q: – down through 205, and I'm not sure whether that's all of them, but then 206 through 208 and then 209?
A: Mm-hmm.
Q: Can you tell by looking at those Aroclors which of those would be considered the dioxin-like Aroclors under the World Health Organization scheme?
A: Can I tell by looking at them? No, not without comparing

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to the actual Aroclor numbers.
Q: You mean the copy of the World Health Organization scheme?
A: Correct, but you can look at – I can compare them to what we have here, which would be similar to – I don't know if we can use this as a proxy list here, but typically the octo-chlorobiphenyls do not fall in the category of dioxin-like PCBs.
Q: So, even if you just take the exhibit that you have prepared which shows a slightly different list of the congeners that you considered as dioxin-like, they're not found on this analysis of Aroclor 1268?
A: I don't see any of them, no.
Q: Have you done enough research into Aroclor 1268 to understand why that could be?
A: I don't understand the question. This is –
THE COURT: I don't think this witness can answer for Dr. Safe.
MR. MATTIONI: Well, I didn't mean to answer for Dr. Safe, your Honor, but –
THE COURT: And, therefore, I won't permit him to try. Dr. Safe can speak for himself, if he chooses to.
MR. MATTIONI: If your Honor please – never mind.
BY MR. MATTIONI:
Q: Are the non-ortho and mono-ortho congeners considered to

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be more or less – which end of the spectrum for –
A: More.
Q: – dioxin-like characteristics?
A: More.
THE COURT: More what?
THE WITNESS: More toxic, I'm sorry.
BY MR. MATTIONI:
Q: And that's because there is 12 chlorines that can be held on the benzene rings that make up the biphenyl portion of it?
A: No, typically we're talking about the pentas-hexas (ph.) in that group, there's a stearic configuration associated with, as you were mentioning, the position of the chlorines, the non-ortho, but they have to be coplanar. None of these listed here are dioxin-like PCB congeners, if –
Q: Because they're not –
A: – if that's the import of your question – I'm sorry.
Q: Because they're not coplanar?
A: Well, if they don't have dioxin-like PCB congener toxicity, so...
Q: But –
A: There may be a variety of reasons, chlorination, the degree of chlorination is only one aspect.
Q: Have you any other what you would consider better or more accurate publications than the one by Safe on the Aroclor makeup of – I mean the congener makeup of Aroclor 1268 that

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you would rely on?
A: I don't understand your question. I haven't read this paper, but the title is, "Synthesis of Octen Non-a-Chlorobiphenol Isomers and Congeners," those are not dioxin-like PCB congeners.
Q: I take it you've never done your own experiment or analysis, congener analysis of Aroclor 1268?
A: Correct, I'm not a chemist.
Q: Aroclor 1268, do you know what its normal condition or how it would be when it was manufactured?
A: No.
Q: Dr. DeGrandchamp, do you know whether or not EPA has set any kind of an action level or equivalent for dioxins and dioxin-like congeners? In other words, you've talked about taking samples, having them analyzed, if a sample comes out to – after you do all the mathematics and all the conversions, if the bottom line adds up to a certain number, do you know what number it would have to exceed in order to be considered as kind of like these different numbers, standards you've used in your testimony?
A: Well, all risk assessors cut to the chase when we get data sets and we usually – it's got to be right there in your right-hand top drawer, you pull out a PRG table and the PRG table represents a de minimus risk level under typical or default conditions. So, we have a concentration that

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corresponds to a de minimus risk level as defined by EPA as one times ten to the minus six. The level developed by EPA Region 9, yes, I do know that value.

Q: Well, but in terms of how you would translate that one times ten to the minus six to an actual number?

A: Yes.

Q: And am I not correct that the number generally accepted in Region 3 is one part per billion?

A: I don't know anything about Region 3, that's a risk management issue, I don't – I can tell you what the PRG is that's been calculated. The concentration corresponds to a de minimus risk level. So, typically, if you go out to a site and you detect a concentration below the total TEQ for dioxin, which is 22 parts per trillion, if you collect a sample that's below that concentration, it's a simple – you know, simple exercise, you just walk away from the site, it poses insignificant or de minimus risk levels.

If I can just continue on with ATSDR, Agency –

MR. MATTIONI: Your Honor, I'm not – I don't understand what we're doing at this point.

THE WITNESS: Okay.

BY MR. MATTIONI:

Q: Now, with respect to the samples that you obtained – were obtained I guess it was at your request, the samples in June of 2002?

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A: I think they had a dual purpose. I can't speak for Ms. Dietz, but I wanted confirmation before I went out on a limb and I wanted some confirmation that those chemicals truly could be – were detected at the site, at the site, but I think that Dr. Medine also needed those chemicals to conduct his background analysis.

Q: Now, in that sample round, the samples taken along the shoreline, they were analyzed both for Aroclors and congeners, is that correct?

A: Aroclors – yes.

Q: The PCB analysis?

A: Yes, yes, yes.

Q: They were also analyzed for dioxins?

A: Correct.

Q: Did you do the mathematics and calculate out the numbers, the TEQs?

A: The TEQs were reported, I didn't need to calculate those.

Q: You didn't add them up?

A: Well, they were added up for me. The analytical laboratory presented the data in total TEQs.

(Pause.)

Q: I've handed you Defendants' Exhibit 1111. Dr. DeGrandchamp, could you please review that and see if you can tell us whether or not that's an accurate listing of the World Health Organization's dioxins and dioxin-like

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congeners?

A: Well, of course I can't be certain without getting – I don't – if you could tell me where this document was – the origin of this document, I don't know, I don't have them memorized, no.

Q: It's from the draft – EPA's draft final – I don't have the name of it – I just gave you the name before and I forgot, but it's the one that – published recently, in 2000 or 2001, that we just discussed a few minutes ago?

A: Oh, the dioxin reassessment.

Q: Yes, the dioxin reassessment, that's the one.

MR. SITHER: Objection, I don't think this was – this says, "Draft."

THE COURT: It says, "Draft, do not cite or quote."

(Laughter.)

MR. MATTIONI: I know what it says, your Honor, but it also –

THE COURT: So it's not official, it's not –

MR. MATTIONI: This witness has testified in part based on the same document, your Honor.

THE COURT: I don't think he's rendered an opinion based upon this in the case in chief. I think he answered a couple of your questions, which were beyond the scope of direct, to the effect that there are expected to be some changes in the levels of toxicity of certain PCBs.

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So, you can ask him a hypothetical –

MR. MATTIONI: Let me work my –

THE COURT: – using the document, you can ask him a hypothetical, but you'll have to establish of course through some evidence that the assumed facts are in fact facts.

MR. MATTIONI: Understood, your Honor.

(Pause.)

BY MR. MATTIONI:

Q: Dr. DeGrandchamp, assuming then Exhibit 1111 accurately reflects the World Health Organization's reassessment of the dioxin-like congeners and dioxins and their TEFs, would you – and assuming that Exhibit D-1111 is authoritative in setting those TEFs for the dioxins and dioxin-like congeners for PCBs, would you please take a look at Exhibit 1110? And the first question, just for accuracy purposes, do we accurately set forth – in other words, repeat and replicate the same congeners as I have on D-1111? Not the values, just the congeners.

A: You want me to make a comparison?

Q: I just wanted to make sure that you're satisfied that we've at least copied them correctly and followed the same set of numbers. We've reversed the order, we have PCBs at the top instead of the bottom.

A: Well, and also you reversed all the numbers, so it would take – give me a second.

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(Pause.)
A: Well, I'm going to assume that you have.
Q: Now, you've said, I think, that your report, laboratory reports added up the TEQs, so that you have the – you know, whatever the dioxin equivalencies were?
A: Mm-hmm.
Q: Assuming, Dr. DeGrandchamp, for Sediment Sample 11, which I think is the fourth column over from the left, assuming that those are – those correctly reported the multiplication involved in taking the results and translating them into the TEQs, can you tell us whether or not some of the TEQs for Set 11 for both PCB dioxin-like congeners based on the World Health Organization's scheme and the dioxins, which equal 46.32, would exceed one part per billion for dioxin TEQs?
A: I don't understand your question.
Q: Well –
A: I don't understand what one part per billion is.
Q: All right. Well, let's leave the one part billion off the – will you –
THE COURT: Just a minute. Now, your proposed Exhibit 110 is what?
MR. MATTIONI: 1110 Exhibit, your Honor, is the results from the June, 2002 congener analysis.
THE COURT: Okay. Prepared by whom?
MR. MATTIONI: This was prepared by Edward W.

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Kleppinger, PhD, who is going to be one of our experts to testify.
THE COURT: And from where did he get the data?
MR. MATTIONI: The data came from plaintiff's report, trip report, which included a set of results from their 2002 inspection and sampling, that's the one they did that we didn't know about, and they – these are their analytical results –
THE COURT: And –
MR. MATTIONI: – which are translated into TEQs.
THE COURT: And these are translations by Dr. Kleppinger?
MR. MATTIONI: That's correct.
THE COURT: And he is using what TEF?
MR. MATTIONI: He's using the World Health Organization's scheme for TEFs, that's what's in –
THE COURT: And does the DEA TEF differ, do you know? Well, do you know?
THE WITNESS: These numbers are – I don't think are the numbers that we saw in the trip report, so they differ. I don't recognize these total TEQs, so it appears that – it appears – again, I don't have a comparison here – that these are not the same TEQs, but I don't know how they were derived.
THE COURT: So this witness can't really testify

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about these.
MR. MATTIONI: That's fine, your Honor. May I have just a moment, please?
THE COURT: Certainly.
(Pause.)
MR. MATTIONI: I have nothing further, your Honor.
THE COURT: Is there any redirect from the Government?
MR. SITHER: Briefly, your Honor.

REDIRECT EXAMINATION

BY MR. SITHER:

Q: Dr. DeGrandchamp, you testified in response to Mr. Mattioni's questions that you are not a risk manager, can you explain to the Court the difference between risk management and risk assessment?
A: Yes. Briefly, a risk assessor evaluates the scientific probability that harm will occur, it's associated with exposure, it's a scientific exercise. A risk manager, on the other hand, has to consider a variety of factors, which is actually more complex than my job, and they have to evaluate the feasibility of implementing remediation, if necessary, the cost of remediation, there's a cost-benefit analysis that I don't have to conduct. So, all I can say at the end of my report is whether or not I think risk exists from a scientific standpoint, but I certainly can't presume to make

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a risk management decision.
Q: Okay. And what kinds of decisions do risk managers make?
THE COURT: That's – we've gone enough on that. Anything from the third-party defendants?
MR. MARTIN: Your Honor, I just have a couple questions.
THE COURT: You may.

CROSS-EXAMINATION

BY MR. MARTIN:

Q: Dr. DeGrandchamp, in the report that you prepared on August 1st, 2001, at Page 4, you make the statement that "recent sampling conducted by EPA Region 3 revealed that dioxin and furan levels are still elevated in Metal Bank sediments," is that statement based on your review of the June, 2002 data?
A: I believe so.
Q: And prior to that sentence which I just read from your report you also made the statement that "high levels of dioxins and furans which are frequently produced during metal salvaging operations were detected over a decade ago in Metal Bank's soils and corbicula, clam, by the Philadelphia Academy of Natural Sciences," do you recall that sentence from your report?
A: It sounds correct.
Q: What was the basis for your determination or your

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opinion, if you still have one, regarding dioxins and furans being frequently produced during metal salvaging operations?

MR. MATTIONI: Objection, your Honor.

THE COURT: Overruled.

THE WITNESS: Well, the detection of dioxins and furans is at the core of the background document I'm developing for the Navy, so I was particularly keen on whether or not those compounds were there at background levels or whether I should have suggested further samples be collected for those analytes that were missing from the data set. I had read in the RI report that these so-called Sputniks, and through conversation with EPA, it sounded like some combustion was occurring at the site, which triggered in my mind as, again, just a scientist that dioxins and furans were being produced either through burning of PCBs or PCB-contaminated materials, but that was a presumption I was making. So, it was just based simply on my cursory observation as I went through the documents.

MR. MATTIONI: I move to strike the presumption, your Honor, since it's not based on any evidence in the record.

THE COURT: Overruled.

BY MR. MARTIN:

Q: Dr. DeGrandchamp, I take it from your testimony that the risk assessment reports that you have reviewed related to the

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Cottman site all underestimate the level of risk to human health, is that correct?

A: That's correct.

Q: Do you have – in any quantitative sense, are you able to give us an opinion about the quantitative extent to which, say one time, ten times, a hundred times, these reports underestimate the risk?

MR. MATTIONI: Objection.

THE COURT: Overruled. Either you have an opinion or you do not.

THE WITNESS: I have a visceral feeling, but no firm quantifiable number I can offer, no.

BY MR. MARTIN:

Q: Can you give us, if you cannot give us a quantitative opinion, a qualitative sense concerning the extent to which in your experience and expertise in the risk assessment field, and given your review of the data that you have seen, particularly the June, 2002 sampling data, the risks have been underestimated?

THE COURT: Is this not repetitive of testimony already elicited on direct?

MR. MARTIN: Your Honor, I don't feel that he's given us a sense to which there has been – the extent to which there has been an underestimate of the risk. I think he has said in the absolute terms he believes there's an

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underestimate, but I don't believe that he has previously testified about the magnitude of any underestimation.

THE COURT: He's just said he can't give you the magnitude of underestimation.

MR. MARTIN: In the quantitative sense, but risk assessors typically speak as well in qualitative terms as well when they can't offer quantitative opinions.

THE COURT: Low, high medium, high-low?

MR. MARTIN: That's exactly what I had in mind, your Honor.

THE COURT: I don't think that's necessary.

MR. MARTIN: Okay. No further questions then.

RECROSS-EXAMINATION

BY MR. MATTIONI:

Q: You mentioned in one of your answers, background?

A: Yes.

Q: And that's something a risk assessor is supposed to consider and take into account, is he not?

A: Yes. Can I qualify that?

Q: You have, in fact –

THE COURT: Just a minute. What do you mean by background and you may qualify that.

THE WITNESS: Thank you, there are two types of background –

MR. MATTIONI: I was going to get there, but that's

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all right.

THE COURT: That's all right.

MR. MATTIONI: You're faster than me, your Honor.

THE COURT: I confess, sometimes I'm impatient. But sometimes I earn impatience. (Laughter.) Proceed.

THE WITNESS: Thank you, your Honor. There's two types of background. It's clear from CERCLA and risk assessment guidance that EPA has developed that if chemicals that are naturally occurring and have not been disturbed through site operations are there at naturally occurring levels. That's background. And CERCLA goes on to say the President shall not authorize funds to remediate those.

When it comes to organic chemicals, which are termed anthrabegenic (ph) background levels, there's a higher threshold for showing that you, yourself have not contributed to the overall regional background levels that the facility is operating in. To point out a hypothetical, if those Sputniks were releasing dioxins around the facility, that would be adding to the burden – the background burden that we call anthrabegenic background around the facility. So, at this particular facility, I don't know that background can be distinguished without congener analysis because we have developed very sophisticated statistical tools now where we can take the ratios that these exist on site and actually fingerprint them like you would fingerprint an individual and

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go out and around the community and see if the same fingerprint exists around the facility.

So, yes, you're supposed to determine background, but it has no bearing on the risk assessment. If the chemicals are there from a scientific standpoint, people are going to be exposed to them. And if that happens, then there are risk. So, no, it is not a risk assessor's job to make risk management decisions about background and whether or not a site poses a risk. But yes, you're supposed to define background and whether or not you've added to the burden of the regional background levels.

BY MR. MATTIONI:

Q: You've written extensively for the United States Navy on this very issue, have you not?

A: I have.

Q: As a matter of fact, you've even opined that it's important to determine what's in anthrabegenic fill so that the Navy shouldn't be required to pay for extra cleanup, haven't you?

A: Anthrabegenic fill that was historical. If I can give you an example, most of the Navy installations in the State of California in the bay area, were built around the turn of the century or at least, that's where the sediments have come from. Back when the earthquake occurred and there was a huge fire, the California fire following the earthquake, we had

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huge amounts of lead-base paint released into the – or lead released in the air through the burning process. And also after those homes burned, there were a lot of PAHs that found themselves in the sediments. Well, in building up those bases, you, of course, have those heavy metals that you are making the base out of and no one thought enough at the tim to take a sample historically so you could sit there and say this is what we started with. And this is what we added to this site. But that was the thrust of the document I prepared for the Navy. And I developed a geochemical approach where we could use the molecular structure of the underlying mineral content of that fill to parse the background component from what the Navy has added to the site. Q Dr. DeGrandchamp, are you familiar with the document entitled "Procedural Guidance for Statistically Analyzing Environmental Background Data"?

THE COURT: Just a minute.

MR. SITHER: Objection, your Honor.

THE COURT: I think we are beyond the scope of the direct and the cross and the examination by Mr. Martin.

MR. MATTIONI: If your Honor pleases, this goes directly to the witness' answer to this last question.

THE COURT: I know, but asking about background appears to be beyond the scope. Are we – we're going into a new subject that was not covered in your cross. And the

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witness has said that – he's given his testimony about background.

MR. MATTIONI: If your Honor please, I have one piece –

THE COURT: Anything more seems to be not helpful.

MR. MATTIONI: – that I think is important at this point.

THE COURT: Well, ask it and I'll see if it's important.

MR. MATTIONI: Dr. DeGrandchamp, in this document which you were acknowledged as a significant contributor, on page 10, characterizing background conditions is an integral part of the baseline human health and ecological risk assessments. These are conducted as part of the RI to ensure that remedy selection is protective of human health and the environment which is one of the two threshold criteria in the NCP. That's correct, is it not, that background is supposed to be an integral part of the remedial investigation?

MR. SITHER: Objection.

THE COURT: Sustained.

MR. MATTIONI: I have nothing further.

THE COURT: You may step down, sir.

THE WITNESS: Thank you.

(Witness excused.)

THE COURT: Today we are going no later than quarter

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of 7:00. But we don't have to go that far, if you can be quicker with your witnesses.

MR. MATTIONI: I was going to ask you if we can end before then, your Honor, if the witness finishes before then.

THE COURT: Right.

MR. MATTIONI: I'll thank you, but my wife will thank you, too. Believe it or not, she wants me to come home.

MR. WILLIAMS: The United States calls Officer Erin Czech.

THE COURT: Right up here, please, Officer.

OFFICER ERIN CZECH, Government Witness, Sworn.

THE CLERK: Please state your name and spell your name for the record.

THE WITNESS: Erin Czech, C-Z-E-C-H.

DIRECT EXAMINATION

BY MR. WILLIAMS:

Q: Please state your name and spell your last name?

A: Erin Czech, C-Z-E-C-H.

Q: With whom are you employed?

A: The Pennsylvania Fish and Boat Commission.

Q: How long have you been employed with them?

A: Seven years.

Q: What is your position with the PFBC?

A: Water Ways Conservation Officer.